ARCADIS

GEORGIA-PACIFIC LLC
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
RESPONSES TO MDEQ COMMENTS ON
FOUR DOCUMENTS RELATED TO BANK MONITORING IN THE
FORMER PLAINWELL IMPOUNDMENT AND PLAINWELL NO. 2 DAM AREA
DECEMBER 2012, ARCADIS

On behalf of Georgia-Pacific LLC (Georgia-Pacific), ARCADIS provides the following responses to the comment letter provided by the Michigan Department of Environmental Quality (MDEQ) on October 26, 2012. In that letter, MDEQ provided comments on four documents:

1. Draft Spring 2012 Bank Conditions Monitoring Report for the Former Plainwell Impoundment and Plainwell No. 2 Dam Area at the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (BCM Report), prepared on Behalf of Georgia-Pacific, dated August 2012
2. Bathymetric Survey at the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site Time-Critical Removal Action (TCRA) near Plainwell, Michigan, dated September 28, 2012
3. Review of Hydraulic Modeling Near the Former Plainwell Dam in Plainwell, Michigan to Evaluate Effects of Remaining Stored Sediment on Bank Stresses, dated October 3, 2012
4. Former Plainwell Impoundment and Plainwell No. 2 Dam Area Fall 2012 Bank Repair Plan Technical Memorandum, dated October 15, 2012

MDEQ Global Comment 1:

> Global Comment: The State is in support of the comments transmitted to ARCADIS by the United States Environmental Protection Agency (USEPA) dated October 15, 2012.

Response:

We acknowledge MDEQ's support of USEPA comments and have prepared a response to USEPA comments. Those responses are submitted in conjunction with this document.

MDEQ Global Comment 2:

> The Administrative Settlement Agreement and Order on Consent for Removal Action (AOC) signatories are the USEPA, the State of Michigan (MDEQ and MDNR) and their legal representatives, and Georgia-Pacific LLC (GP) (and Millennium Holdings, LLC, which has undergone bankruptcy proceedings). The Natural Resource Damage Trustees for the Kalamazoo River Environment (Trustees) are not signatories to the AOC, and while the Trustees' participation is welcome, they do not have decision making or approval authority under the requirements of the AOC. On Page 1-4 in the BCM Report, the text states, "No immediate maintenance needs to address bank stability were identified by the Trustees following the 2011 bank inspection." Further references to the Trustees' approval authority are made throughout the documents. The State wishes to clarify that the Trustees provide valuable input regarding implementation of the removal action, but do not have approval or disapproval authority for required work under the AOC.

Response:

We acknowledge that USEPA, MDEQ, and Michigan Department of Natural Resources (MDNR) retain ultimate decision-making authority under the AOC. Section 1, Page 1-2 of the Former Plainwell Impoundment and Plainwell No. 2 Dam Area 2012 Bank Conditions Monitoring Report (2012 BCMR) has been revised to address this topic. The term “Trustees” will continue to be used in the report for the sake of simplicity and clarity.

MDEQ Specific Comment 3:

> For future information, the Michigan Department of Attorney General is also a Trustee for the State of Michigan as designated by the Governor

Response:

Michigan Department of Attorney General has been added to the list of Trustees identified in Section 1, Page 1-2 of the 2012 BCMR.

MDEQ Specific Comment 4:

> Under Paragraph 15 of the AOC, work to be performed includes cut-back and stabilization of river banks.
>
> The USEPA's Comment #2 in its letter dated October 15, 2012, regarding the Report, states, “We observed some areas of continuing erosion in the former Plainwell Impoundment area that are between the US 131 bridge and the pipeline crossing that should be treated with rock. Specifically, RA 6B and 10A need to be addressed. These areas do not have stable banks and continue to erode."
>
> The State concurs with the USEPA's observations of these areas. While the addition of rock may provide stabilization of the banks in these areas, further actions to address the instabilities of the banks in these areas may be needed by GP.

Response:

On November 15, 2012, ARCADIS, on behalf of Georgia-Pacific, submitted a technical memorandum titled “Former Plainwell Impoundment and Plainwell No 2 Dam Area Proposed Repair Memo - Revised November 2012” to describe the bank repair to be implemented in Removal Area 6B. Specifically, rock will be placed from the existing toe-of-slope to the prism-out 2-year storm elevation. Live willow stakes will be installed above the prism-out 2-year storm water elevation to support bank stability as woody roots develop and to increase the habitat quality of the floodplain by providing woody habitat.

GEORGIA-PACIFIC LLC
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE
RESPONSES TO MDEQ COMMENTS ON
FOUR DOCUMENTS RELATED TO BANK MONITORING IN THE
FORMER PLAINWELL IMPOUNDMENT AND PLAINWELL NO. 2 DAM AREA
DECEMBER 2012, ARCADIS

On December 7, 2012, ARCADIS, on behalf of Georgia-Pacific, submitted a sampling plan for Removal Area 10A. The letter was approved by USEPA on December 8, 2012. As described in a December 7, 2012 letter this material was sampled on December 17 and 18, 2012 to evaluate the presence of polychlorinated biphenyls (PCBs). Under the supervision of USEPA, five cores were advanced on December 17, 2012. The fine-grain material from each location was homogenized and a single composite sample was submitted to KAR Laboratories in Kalamazoo, Michigan for PCB analysis. The sample results will be used to further evaluate whether bank maintenance is warranted in this area. On December 18, 2012, the cores were collected from the same five locations. The fine-grain material from each core was homogenized and one sample from each core was submitted to KAR Laboratories for PCB analysis. PCBs were not detected in any of the six samples submitted for laboratory analysis. Based on these results no bank maintenance activities are warranted in this area.

MDEQ Specific Comment 5:

> Section 1.2.3, Page 1-4, the BCM Report states:
>
> "Per section 5.6 of the Former Plainwell Impoundment Design Report (ARCADIS BBL 2007a), 'Banks and riparian habitats observed to be stable after a 2-year storm event will be concluded to be stable.' Multiple flows exceeding the 2-year event flow have occurred since completion of the TCRA in the former Plainwell Impoundment. No immediate maintenance needs to address bank stability were identified by the Trustees following the 2011 bank inspection."
>
> Given the current record low flows and the continued presence of the prism, the State does not agree that observation of a single 2-year event in these circumstances can provide a basis for concluding that the banks in these areas are stable." Page 2-49 of the Design Report states that, "Based on work at other sites, the geomorphic response following the dam removal should occur within a 1- to 5-year time period." The flow levels of the Kalamazoo River are at a record low. Multiple 2-year or greater events are necessary to be indicative of bank stability. The continued presence of the prism also adds to uncertainty for future stability issues. Bank undercutting, sloughing, loss of armoring materials and signs of lateral bank movement have been observed by the USEPA, MDEQ, and MDNR indicating stable banks have not been achieved. Until the observed bank erosion has stabilized after exposure to 3 or more 2-year events, they should not be considered stable.

Response:

As described in Section 1.2.3 of the 2012 BCMR, four, not one, 2-year events have occurred since completion of restoration activities at the former Plainwell Impoundment in June 2009. Regardless, the 2012 BCMR does not conclude that banks are stable because they have remained stable after four 2-year storm events. The 2012 BCMR does not include any conclusions regarding bank stability – the objective of the report is to present an evaluation of temporal changes in bank conditions and an

assessment of whether adaptive management of the banks is required. Response to a 2-year storm event is one part of that evaluation.

MDEQ Specific Comment 6:

> Section 4.1, Page 4-1, second paragraph.
>
> Changes less than 6 inches should be included in Table 2 since over time the cumulative effect of the material loss/gain can be significant.
>
> Additionally, the text states "Any observed change of less than half a foot is considered to be insignificant. The absolute value of material loss or deposition is not as important as the geometry of the bank profile from year to year." The absolute value of material loss/gain is important considering polychlorinated biphenyl (PCB) contaminated soils exist in the floodplain. For example, the geometry of the bank may be consistent from year to year, but if the bank is losing material laterally so that it will eventually erode into contaminated material, that is extremely important to recognize. Given the uncertainties associated with the river channels response to the dam removal, all areas of the site need to be carefully considered.

Response:

Changes of less than 6 inches are within the range of error associated with survey data collection and evaluation and are therefore not included in Table 2. In addition, the buffer zone between PCB-containing materials remaining in the floodplain and the river was designed to be 30 feet, so an annual change of 6 inches is unlikely to expose PCB-containing floodplain soil to the river. Furthermore, the evaluation presented in Table 2 is one of several evaluations carried out as part of the development of the 2012 BCMR; therefore, banks that are eroding at a rate of less than 6 inches per year for consecutive years can still be identified and evaluated.

MDEQ Specific Comment 7:

> Section 4.1, Page 4-1, first bullet.
>
> The text states "The profiles of the banks are classified as consistent with the previous year; therefore, immediate bank maintenance is not warranted." This bullet should be removed, as plans for bank work are currently being developed and construction will begin this year.

Response:

A draft version of the 2012 BCMR was submitted to transmit results of the spring monitoring activities to USEPA and the Trustees and to provide a preliminary evaluation of areas warranting additional

consideration. The Final 2012 BCMR has been revised to identify areas where repairs were implemented. Documentation of completed repairs will be submitted as an addendum to the 2012 BMCR.

MDEQ Specific Comment 8:

> Section 6.3, Page 6-2, first paragraph.
>
> There are erosion control measures to protect banks other than coir logs and armoring. The report should provide other examples such as installation of toe wood, root wads, or in stream controls like J hooks, or widening of the channel to increase overall stability.

Response:

We acknowledge there are other potential erosion control measures. Section 2.5 of the 2012 BCMR generally describes the adaptive management approach employed in the bank monitoring program, and includes the measures that have been implemented or evaluated to date. This list is not intended to be an exhaustive list. It also states that other measures will be evaluated on a case-by-case basis. These other measures could include any of the erosion control measures stated above.

MDEQ Specific Comment 9:

> Section 6.4, Page 6-3, the BCM Report states:
>
> "The bank restoration design considered Trustee concerns related to limiting bank use by wildlife if armor were present. Therefore, less armoring was used in bank restoration than originally designed, which likely reduced the short-term stability of banks restored without armor."
>
> It is important to note for the record that the "original design" was rejected by the USEPA as a bad faith deliverable because it ignored over two years of input from the Trustees, who consistently worked to limit the amount of hard armoring used during the removal action. For accuracy in the BCM Report, the reference to the "original design" should be removed.

Response:

We disagree that the deliverable was submitted in “bad faith”. There were concerns that limiting the amount of hard armor could lead to erosion in certain areas, and that has in fact happened. While the original design was modified to limit use of hard armoring, maintenance activities have subsequently incorporated hard armoring in a large portion of the areas that were proposed to be armored in the original design.

However, since areas requiring bank repair were determined through a series of conversations with USEPA and the Trustees, Section 6.4 “Factors Considered in Determining the Need for Bank Repairs” has been removed from the Final 2012 BCMR.

MDEQ Specific Comment 10:

> Section 6.4, Page 6-3, the BCM Report states:
>
> "The floodplain excavation included in both TCRAs was completed to a distance 30 feet back from the existing top of bank to create a 'clean buffer' zone. The depths of removal within the clean buffer areas were established to target the removal of soils containing documented PCB concentrations greater than 5 milligrams per kilogram (mg/kg). As a result, there is little risk of exposure to and/or downstream transport of residual PCB containing materials in the floodplain or river bank due to lateral erosion."
>
> This section should clarify that the clean buffer has already eroded in several areas and is continuing to be lost, especially where the channel form is the least stable. As a result, these risks continue to be evaluated and the broad statement regarding "little risk of exposure...or downstream transport" should be modified to reflect these unknowns.

Response:

The buffer zone was completed to 30 feet because the project design recognized that lateral erosion associated with natural river processes that increases the interaction of the Kalamazoo River with its floodplain are acceptable, and that some lateral erosion and loss of a portion of the clean buffer was likely to occur, reducing the overall width of the buffer zone. However, the project was designed to maintain some buffer between the Kalamazoo River and the residual PCBs potentially present in the banks.

Areas where the most significant erosion to the buffer have occurred (Removal Areas 7, 8, and 9B) have been protected with rock, limiting the potential for future erosion. Maintaining the full 30-foot buffer is not as important as maintaining a buffer between PCB-containing floodplain soil and the river.

However, we acknowledge that should the buffer fully erode, there is the potential for exposure/downstream transport of residual PCB-containing materials. Since areas requiring bank repair were determined through a series of conversations with USEPA and the Trustees, Section 6.4 “Factors Considered in Determining the Need for Bank Repairs” has been removed from the Final 2012 BCMR.

MDEQ Specific Comment 11:

> The State agrees continuing erosion in the Plainwell No. 1 Dam Impoundment between the US 131 bridge and the pipeline crossing should be treated with rock up to the bankfull elevation. Two areas specifically need to be addressed: RA 6B and 10A and beyond. These

areas do not have stable banks and continue to erode and given the constricted stream channel width, it is necessary to provide continuous rock protection along the water line and up the slope to the bankfull elevation. As stated above, Trustee input on addressing erosion issues is valued, but the Trustees do not have approval or disapproval authority for proposals regarding the scope of work for areas 7B, 8B, 9B, and 10A.

Response:

Removal Areas 6B and 10A are addressed in the response to Specific Comment #4. In addition, the approach agreed upon for Removal Areas 7, 8, and 9B is described in Section 6.3.2 of the 2012 BCMR.

MDEQ Specific Comment 12:

On Page 4/8 of the fall 2012 Bank Repair Plan Technical Memorandum, the erosion in RA 6B is attributed to the formation of two islands downstream of the US 131 bridge. The text states, "The bridge and islands appear to divert water flow towards the banks in a manner that was not anticipated during the TCRA design." This is further evidence that river stability has not been achieved and supports the State's position that further corrective actions and monitoring will be needed by GP.

Response:

Maintenance, as described in response to Specific Comment #4 is underway. As described in the response to Specific Comment #20, there is no basis for delaying transfer of the monitoring and maintenance program to the MDNR beyond the March 31, 2013 date established by the AOC.

MDEQ Specific Comment 13:

The mid-channel "prism" of former impoundment sediments remains just above the former Plainwell Dam, and upstream of Mid-Channel Removal Area B. The State believes that the presence of the prism affects flow and results in stresses in bank areas. Although no action on the mid-channel sediments is being requested, these areas should continue to be monitored as the sediments erode.

Response:

We acknowledge that these areas are present and warrant continued monitoring for the duration of the monitoring period (March 30, 2013). On October 3, 2012 ARCADIS, on behalf of Georgia-Pacific, submitted a letter titled “Review of Hydraulic Modeling Near the Former Plainwell Dam in Plainwell, Michigan to Evaluate Effects of Remaining Stored Sediment on Bank Stresses” to evaluate the effects of the mid-channel prism.

MDEQ Specific Comment 14:

The rock slope on the left bank (facing downstream) at the former dam powerhouse is slumping and should be corrected. The rock relocation proposed in the fall 2012 Bank Repair Plan should be sufficiently anchored/placed to ensure slumping does not occur in future high water events. Appropriate vegetation will need to be established where rock is removed.

Response:

The agreed-upon corrective action that is being implemented in this area of the river (the Western Channel) is described in Section 6.2.1 of the 2012 BCMR. Approximately 20 cubic yards of rip rap will be placed. No re-vegetation of exposed banks will be necessary, as new rock will be added – no existing rock will be moved.

MDEQ Specific Comment 15:

An additional area of bank erosion has been identified since the previous site visits. The right bank, upstream of U.S. 131 is actively eroding, generally in the vicinity of Removal Area 4A. This is an area where the buffer was of limited utility due to the relatively low elevation of the bank in relation to the river. River flow has apparently eroded the shelf that was present following excavation. Flow is now against the bank in this area and contaminated residuals are eroding directly into the river. This area should also be evaluated for some kind of bank enhancements.

Response:

On November 15, 2012, ARCADIS, on behalf of Georgia-Pacific, submitted a technical memorandum titled “Former Plainwell Impoundment and Plainwell No 2 Dam Area Proposed Repair Memo - Revised November 2012” to describe the bank repair to be implemented in Removal Area 4A. Specifically, clean fill will be placed on the existing slope to isolate the exposed residuals. Rock will be placed on the clean fill from the toe-of-slope to the prism-out 2-year storm elevation. This is described in Section 6.2.2 of the 2012 BCMR.

MDEQ Specific Comment 16:

Table 1

The Rosgen reference included is for his WARAS5_ book published in 2006; however, the table provided appears to be from Rosgen's Applied River Morphology book published in 1996. To match current Rosgen Bank Erosion Hazard Index (BEHI) practices, the table needs to be updated by removing the header "Root Density" and changing to 'Weighted Root Density'', which is the root density divided by the ratio of the root depth to study bank height.

The 2006 reference should be added to Section 8.

Response:

Techniques presented in Rosgen's 1996 Applied River Morphology book provided the basis for the field activities that were utilized to monitor bank status for this project. The date of Rosgen's Applied River Morphology book was incorrectly listed in the reference section as 2006, and this has been updated on Table 1 and in the references section of the report. We have not changed the table column header and continue to use Root Density in the 1996 BEHI assessment methodology to provide consistent data for comparison of bank characteristics over time.

MDEQ Specific Comment 17:

Table 2

Include justification and/or rationale (in table or text) for whether a bank profile is consistent with the previous year. For example, T-10S indicates the "bank profile consistent with 2011," however; this should say "continued loss of material" as the table includes both vertical and lateral losses. Include detail (in table or text) how the vertical and lateral changes were calculated/derived. For example, are the loss/gain values included in these columns an average, a maximum, or some other quantification? Include observed loss/gain values less than 6 inches in parenthesis to show trend over time. For example, NC (0.2).

Response:

As discussed in the response to Specific Comment #6, the quantification method is not accurate to within 6 inches; therefore, no values less than 6 inches are included in the table. The values were derived using electronic distance measuring software, which targeted the maximum horizontal and vertical distance changes between years at each transect location. Changes of less than 6 inches resulted in a conclusion that the bank profile was consistent with the previous year.

MDEQ Specific Comment 18:

Table 3

Add easting/northing for each area where BEHI's were measured.

ERROR IN CALCULATING BEHI - The table has a fundamental error when calculating BEHI ratings. Some may change both the total score and BEHI classification while others may only change the total score, but still be in the same BEHI range. The apparent flaw is in the 'Root Density Value' calculations. This error was commented on in 2011 and was not revised.

a. Root Density Value- based on current Rosgen practices, the 'Weighted Root Density' is calculated by multiplying the Root Density assigned in the field (and included in Table 2) by the 'Root Depth/Study Bank Height' ratio. The error in the table is that the 'Root Density' was used to get a BEHI rating, instead of the 'Weighted Root Density'. For example, using C1, the root depth to bank height ratio should be 0.5/5.4 = 0.09. The assigned Root Density in the field was 80% or 0.80. To calculate a BEHI rating, multiply 0.8 by 0.09 to get 0.072 (or 7%); this value is used in the BEHI rating curve to yield a value of at least 9, not 2 as shown. This error will impact all Weight Root Density values, and therefore, all total BEHI scores.

b. Root Depth/Bank Height Value - since this value is apparently shown as a percentage, the units should be identified. Figure 12 – the map should show where the exact BEHI measurements were recorded for each bank segment evaluated.

Response:

Eastings/northings were not recorded where BEHI bank characteristics were measured and recorded. The lengths of each BEHI classification were physically measured in the field with a distance measuring wheel.

No error was made when calculating BEHI ratings. The 1996 Rosgen methodology was consistently applied over the monitoring period and provided the relative data required to identify changes in bank conditions.

MDEQ Specific Comment 19a:

MDEQ requests for following data. If the data has been provided, then we request assistance in locating the information.

a. Bank profile data for all events in this report depicted on Figures 4-11 and 14-17, including the post construction survey. Table of data should include date; transect ID, station number, elevation (or an easting, northing, elevation for every point). Also provide the coordinates and elevations for the starting point (sta 0+00) for each transect.

Response:

On July 16, 2010, ARCADIS submitted to Michigan Department of Natural Resources and Environment a data package of survey data collected to date at the Former Plainwell Impoundment. The data package included:

- Northing, easting, and elevation data for post-construction surface elevations at the former Plainwell Impoundment as collected in the bank, floodplain, and in-stream sediment areas.

- Bathymetric survey data including transect ID, station number, northing, easting, and sediment elevation for the 10 United States Geographical Survey (USGS) transects established in the former impoundment from 2000 (collected by USGS) and 2006 to 2010 (collected by ARCADIS).

- Bank elevation monitoring data collected by ARCADIS in 2009 and 2010.

Bank elevation monitoring data collected by ARCADIS in 2011 were submitted to MDEQ in the May 2011 Monthly Progress Report for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site Supplemental Remedial Investigation/Feasibility Study (SRI/FS) (Report #51).

Bank elevation monitoring data collected by ARCADIS in 2012 were submitted to MDEQ in the March 2012 Monthly Progress Report for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site SRI/FS (Report #61).

Therefore, MDEQ has received bank profile data for all events depicted on Figures 4-11 through 4-17 including post-construction survey data.

MDEQ Specific Comment 19b:

> b. X, Y, Z for in stream sediment survey transects.

Response:

This information was provided as a part of the July 16, 2012 submittal. See the response to Specific Comment #19a.

MDEQ Specific Comment 19c:

> c. X, Y coordinates of BEHI measurements for each year.

Response:

See the response to Specific Comment #18.

MDEQ Specific Comment 20:

> There is a substantial amount of corrective action necessary this year and a stable channel has yet to be established. Therefore, the State recommends that an additional 2-year monitoring period is needed to ensure that those measures recommended herein are shown to be successful after installation and that the goal of establishing a stable stream channel in addition to stable banks in the former impoundment has been achieved, prior to the transfer of bank monitoring obligations to the property owner.

Response:

Paragraph 43.a of the Administrative Settlement Agreement and Order on Consent for Removal Action for the Plainwell TCRA states that "in the interest of early action and settlement, the MDNR will contribute $500,000 to the response actions required by this Settlement Agreement in the manner set forth in Paragraph 43.b and **will undertake the post removal site control obligations set forth in Paragraph 43.c**" (emphasis supplied). Paragraph 43.c states "**Beginning three years after MDR's receipt of the Notice of Completion of Work pursuant to Paragraph 77, MDNR agrees to perform post removal site control as set forth in Paragraph 18**" (emphasis supplied). USEPA issued its Notice of Completion of Work on March 30, 2010. Accordingly, MDNR is legally bound to take over the post-removal site control on March 31, 2013.